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Connections

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CMPT QUARTERLY ON-LINE NEWSLETTER

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A Happy and Successful re-Certification

Congratulations to us! Our proficiency testing program has been internationally assessed and, again, our quality management program was recertified and is in compliance with ISO 9001:2008. This makes for 11 consecutive years. For 10 of these 11 assessments (including this year) we were found to have no non-conformances. There were two minor opportunities for improvement, both of which we were able to address on the spot.

We are pretty pleased with our accomplishment, and when we last checked with our laboratory participants, nearly ninety percent of survey responders said that CMPT meeting the ISO standard demonstrated a commitment to quality and, as a result, has increased our credibility. So that makes a win-win for us and our participants.

Michael Noble, chair CMPT

IN THIS ISSUE

We've got mail!

CMPT received a letter from Dr. Mailman (IWK Health Centre, Halifax, NS) regarding susceptibility comments made in critique M113-5. The Clinical Bacteriology Committee believes that his points are valid and that the participants would benefit from them, so we decided to publish the letter and made the suggested changes to critique M113-5.

CMPT's email has changed!!

Our email address has been changed to cmpt.path@ubc.ca. We will receive emails directed to our old address: cmpt@interchange.ubc.ca for some time, but please update your records as soon as you can.

Please also be aware that when you receive an email from CMPT, the sender will now show: "UBC-PATH CMPT" instead of "CMPT."

Thank you for your patience.

Our lab at the IWK participates in CMPT and we find it an extremely well run and helpful program. I just had a comment about the M113-5 survey. The topic was certainly a good one.

The recommendation to include an AmpC comment for *Enterobacters, Citrobacter freundii, Serratia,* etc. is also good but the wording of the suggested comment by CMPT could put clinicians in a medico-legally awkward situation. In pediatric patients, where fluoroquinolones are not Health Canada approved, third generation cephalosporins are certainly used for these organisms in pediatrics. Clinicians should certainly know to be vigilant for suboptimal responses, but a quick search of PubMed shows that third generation cephalosporins commonly and successfully treat the SPICE group of infections.

In addition, the carbapenems are beta-lactams and the CMPT wording suggests that these should also be avoided when in fact they are the drugs of choice for many situations with these organisms.

I would suggest the comment stop at the second sentence. Treatment with broad spectrum cephalosporins may result in selection of resistant strains. Notably CLSI does not agree with the intrinsic resistance of all penicillins for these organisms (see M100-S22 Appendix B).

Again - we feel CMPT does an excellent job with its program but I just felt that with this one survey the comment did not really reflect what is happening in clinical practice and to avoid beta lactams is really wrong as carbapenems are beta-lactams. Thanks!

Tim Mailman MD FRCPC
Chief, IWK Department of Pathology and Lab Medicine
Associate Professor Pathology Pediatrics
IWK HealthCentre, Halifax, NS

Comment: CMPT Survey M113-1

Recommendations for Antibiotic Susceptibility Testing and Reporting for Bacteria Isolated from Urine Cultures Collected from Out-Patients - CMPT Survey M113-1

CMPT recently sent out a simulated midstream urine sample collected from a 20 year male out-patient with dysuria. The sample contained ≥100 X 10^6 cfu/L pure growth of *E. coli*. Although most participants had no trouble identifying this organism, the reporting of appropriate primary antibiotics was problematic. This *E. coli* demonstrated a dissociated antibiotic susceptibility between cephalexin (resistant) and cefazolin (susceptible), and was resistant to gentamicin.

Women presenting with symptoms of acute urinary tract infection (UTI) in the community mainly have uncomplicated episodes (i.e., cystitis) that can be managed with oral antibiotics (i.e., single high dose or short course therapy). In contrast, men presenting with symptoms of acute UTI, regardless of their care location [(i.e., community practice or Emergency Department (ER)], usually have complicated infections caused by urinary tract obstructions or other abnormalities that result in upper tract infection (i.e., pyelonephritis) and/or acute prostatitis with or without bacteremia. Therefore, there is a much higher likelihood that the symptomatic male patient with acute UTI will be immediately referred to the ER for assessment and appropriate management that includes parenteral antibiotic treatment.

The clinical laboratory cannot assume that all patients that have urine cultures ordered in a community care location will be treated at that location. In addition, the clinical laboratory cannot distinguish which ambulatory patients with acute UTI need to be immediately referred to the ER regardless of the ordering location, age, gender or other factors. Additionally, more complex treatments including dialysis and intravenous therapy are being done as part of homecare for elderly and rehabilitation patients. The clinically relevant reporting of antibiotics on isolates recovered from urine specimens collected from ambulatory patients should include a least one parenteral choice, which would prevent the delay of appropriate antibiotic therapy in the sickest patients (i.e., those needing referral to the ER).

ER clinicians commonly give a single high dose of an aminoglycoside (i.e., gentamicin or tobramycin) as initial parenteral antibiotic therapy for patients presenting with complicated UTI. Alternatively, a single dose of ceftriaxone may be given pending receipt of the antibiotic susceptibility report.

Many laboratories that only perform microbiology testing on out-patients failed to report either gentamicin or tobramycin on the *E. coli* isolate in this survey, even though it is recommended by CLSI that these drugs are Group A agents that should be tested and reported. Some laboratories also wrote to CMPT to say that they only report oral antibiotic choices on out-patient urine samples.

The *E. coli* isolated from the urine sample in this 20-year old male out-patient was resistant to gentamicin. Failure to report gentamicin and/or tobramycin in this case would have potentially resulted in this patient receiving inappropriate drug therapy in the ER which could have a serious clinical outcome in a patient with a complicated infection.

Main Educational Points:

⇒ Laboratories should not assume that patients who have urine cultures ordered at an out-patient location will be treated with a conventional mode of therapy in an ambulatory location.

⇒ At least one parenteral antibiotic choice that is susceptible should be reported for urine isolates recovered from ambulatory patients.

⇒ Gentamicin and tobramycin are listed by CLSI as Group A (Primary Test and Report) agents for *E. coli* urine isolates. Laboratories should routinely test both drugs, but only report gentamicin provided the result is susceptible.

⇒ All *E. coli* isolated from urine cultures from ambulatory patients should also be tested for susceptibility to both cephalexin and cefazolin.

Dr. Deirdre Church, Calgary Laboratory Services, Calgary, AB.
- Dr Church is a member of CMPT's Clinical Bacteriology Committee -

Group B streptococcus Screening and Susceptibility Testing

David J. M. Haldane MD. Queen Elizabeth II Hospital, Halifax, NS

Group B streptococcus (GBS) is an important cause of neonatal sepsis with the potential for high case fatality. It was originally described as a cause of bovine mastitis (hence the species, "agalactiae") in the 1890's, but was recognized as a cause of human disease in the 1960's by Eickhoff et al who described infections in neonates and adults[1]. In the 1970's GBS was increasingly recognized as a cause of infection in neonates. In this group it can occur as early onset disease which occurs on days 0 – 6 and is manifested as sepsis, pneumonia or meningitis. This early infection develops as a result of vertical transmission of the organism from the maternal flora during birth. It accounts for up to 85% of infections in neonates with GBS and has a higher mortality than late onset disease. Late onset disease occurs after the first week of life and up to three months of age. The late onset disease is manifested by sepsis or meningitis. In this setting, the organism is either acquired from the mother, which may include vertical transmission during birth, or from other environmental sources[2].

GBS colonizes the gastrointestinal or the genito-urinary tract in 10-30% of women[2]. The presence of the organism has been recognized as the most important risk factor for the development of early onset neonatal disease.

Transmission of GBS to the newborn can be interrupted by giving intravenous antibiotics during labor. The practice of giving intra-partum antimicrobials resulted in a 70% reduction in the number of cases of GBS in the decade before 2002. While this approach reduced the number of cases in neonates, there were also risks, which included allergic reactions by the mother, superinfection with yeast in the baby, and the potential for development of resistance in the organism. It was desirable to use antimicrobials where they would be beneficial, but avoid them where they were not required.

There was a debate whether a screening approach using cultures of all pregnant women, or a risk-based approach, where only women with risk factors known to be associated with early onset GBS infection would be the best way to determine which woman should receive prophylaxis. In North America, this debate was resolved in favor of screening in 2002. A study by Schlag et.al showed that women who were screened at 35 to 37 weeks gestation and, if screened positive, were given intra-partum chemoprophylaxis (and also women who had group B streptococci in urine or who had had a previous baby with GBS infection) had about half the risk of having early onset GBS disease compared to women treated on the basis of risk factors alone[6]. Women who were screen positive had a 25 fold higher risk of their baby having early onset disease than those who screened negative[5]. The timing was important because GBS colonization can change over time, and it was desirable to allow some time between screening and birth. It was found that if screening was done within 5 weeks of birth, the sensitivity of the screen was 87%, but decreased rapidly if more time elapsed[1]. These findings lead the CDC to recommend universal prenatal screening for vaginal and rectal GBS colonization, at 35 to 37 weeks gestation in 2002. These guidelines were updated in 2010[2]. The Society of Obstetricians and Gynecologists of Canada developed a guideline in 2004 which was consistent with the 2002 CDC guidelines[4].

Culture

In Canada, universal screening for GBS is recommended at 35 to 37 weeks gestation[3]. A swab should be taken of the lower vagina and then the rectum (or two separate swabs can be taken). These can be self-collected by the patient. The swab should be sent to the laboratory in transport medium (Amies or Stuart's transport medium without charcoal) and cultured in a selective broth medium (examples are LIM broth, or TransVag broth) which are based on Todd Hewitt broth with antimicrobials added, and incubated for 18 to 24 hours at 35°C either in ambient air or 5% CO_2. The broth is sub-cultured to blood agar and growth of GBS is detected. Various means of augmenting detection have been proposed, including selective media, using GBS pigment production in anaerobic conditions, nucleic amplification methods, chromogenic media and DNA probes. Direct detection from the specimen by nucleic acid amplification is also acceptable[2,4].

Susceptibility Testing

The vast majority of GBS remains fully susceptible to penicillin. Isolates with increased MIC to penicillin have been reported in Japan and the US. These strains have most commonly had mutations affecting the penicillin binding proteins, and remain very rare. Routine suscep-

tibility testing of GBS for penicillin is not recommended. When a patient has an allergy to penicillin, cefazolin can often be used for treatment instead of penicillin, but if there is a history of a severe penicillin allergy, the use of either penicillin or cefazolin is avoided. There is much less data on the agents that can be used when penicillin or cefazolin are not available. When they are used for prophylaxis, levels of clindamycin or erythromycin in the newborn tend to be lower and efficacy is less certain[2]. In the 2010 CDC guidelines the choice of antimicrobial agents that can be used is clindamycin or vancomycin. Note that while erythromycin was recommended as a possible agent in the 2002 CDC guidelines, it is no longer considered appropriate for prophylaxis in the 2010 CDC guidelines. The Canadian guidelines from the Society of Obstetricians and Gynecologists of Canada (SOGC) that were published in 2004 reflected the 2002 guidelines and recommend erythromycin as an alternative agent for prophylaxis in the severely penicillin allergic patient. These guidelines have not been updated.

To determine susceptibility to clindamycin, the D-Test with erythromycin is recommended. While this method provides a susceptibility result for erythromycin, it should not be reported as it is only used to determine the potential for induced resistance to clindamycin. If the GBS isolate, is inducibly resistant (i.e. D-Test positive) or if the results are not known, vancomycin is recommended because of the high rates of clindamycin resistance which has now reached rates in excess of 20-30%. While the 2004 SOGC guidelines recommend clindamycin or erythromycin, evidence is accumulating that erythromycin is not an appropriate choice. Antibiotic therapy in the setting of penicillin allergy may be reviewed when the Canadian guidelines are updated.

In a recent survey, susceptibility testing for a GBS isolate from a prenatal screen of a penicillin allergic patient was required. While many laboratories followed the Canadian guidelines and reported the clindamycin and erythromycin susceptibilities, the committee felt after much discussion, that there is now evidence that erythromycin should not be reported as suggested by the updated CDC guidelines. During prenatal screening, when susceptibilities are performed, the recommendation for laboratories from the CMPT Bacteriology Committee is to report clindamycin susceptibility (using the D-Test to detect inducible resistance) and to report vancomycin susceptibility, but not to report erythromycin susceptibility on GBS isolates from penicillin allergic pregnant women.

Dr. D. Haldane is a member of CMPT's Clinical Bacteriology Committee

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Check Clinical Bacteriology related Survey M114-3 at http://www.cmpt.ca/critiques/2012/M114-3.pdf

Upcoming events

JUNE 2012

15th International Congress on Infectious Diseases (ICID)

June 13-16, 2012, Bangkok, Thailand

More information: http://www.isid.org/icid/index.shtml

ASM General Meeting

June 16 - 19 , 2012, San Francisco, USA

More information: http://gm.asm.org/

CSM 62nd Annual Conference

June 20 - 23, 2012, Vancouver, British Columbia

More information: http://www.csm-scm.org/english/conf_upcoming.asp

Anaerobe 2012

June 27 - July 1, San Francisco, California

More information: http://www.anaerobe.org/2012/anaerobe2012.html

AUGUST 2012

The 30th World Congress of Biomedical Laboratory Science

August 18 - 22, Berlin, Germany

More information: http://www.ifbls-dvta2012.com/

OCTOBER 2012

52nd ICAAC

September 9 - 12, San Francisco, CA

More information: http://www.icaac.org/

ABOUT CONNECTIONS

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